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SEQUENCE LISTING

<110> HEIN, MICH B.
HIATT, ANDREW C.
FITCHEN, JOHN H.

<120> NOVEL EPITHELIAL TISSUE TARGETING AGENT

<130> EPI3004B

<140> 09/005,318

<141> 1998-01-09

<150> 08/782,481

<151> 1997-01-10

<150> 09/005,167

<151> 1998-01-09

<160> 113

<170> PatentIn Ver. 2.1

<210> 1

<211> 137

<212> PRT

<213> Homo sapiens

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1 5 10 15

Arg Ile Thr Ser Arg Ile Ile Arg Ser Ser Glu Asp Pro Asn Glu Asp
20 25 30

Ile Val Glu Arg Asn Ile Arg Ile Ile Val Pro Leu Asn Asn Arg Glu
35 40 45

Asn Ile Ser Asp Pro Thr Ser Pro Leu Arg Thr Arg Pro Val Tyr His
50 55 60

Leu Ser Asp Leu Cys Lys Lys Cys Asp Pro Thr Glu Val Glu Leu Asp
65 70 75 80

Asn Gln Ile Val Thr Ala Thr Gln Ser Asn Ile Cys Asp Glu Asp Ser
85 90 95

Ala Thr Glu Thr Cys Tyr Thr Tyr Asp Arg Asn Lys Cys Tyr Thr Ala
100 105 110

Val Val Pro Leu Val Tyr Gly Gly Glu Thr Lys Met Val Glu Thr Ala
115 120 125

Leu Thr Pro Asp Ala Cys Tyr Pro Asp
130 135

<210> 2
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 <212> PRT
 <213> Mus sp.

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 Arg Ile Thr Ser Arg Ile Ile Pro Ser Ala Glu Asp Pro Ser Gln Asp
 20 25 30
 Ile Val Glu Arg Asn Val Arg Ile Ile Val Pro Leu Asn Ser Arg Glu
 35 40 45
 Asn Ile Ser Asp Pro Thr Ser Pro Met Arg Thr Lys Pro Val Tyr His
 50 55 60
 Leu Ser Asp Leu Cys Lys Lys Cys Asp Thr Thr Glu Val Glu Leu Glu
 65 70 75 80
 Asp Gln Val Val Thr Ala Ser Gln Ser Asn Ile Cys Asp Ser Asp Ala
 85 90 95
 Glu Thr Cys Tyr Thr Tyr Asp Arg Asn Lys Cys Tyr Thr Asn Arg Val
 100 105 110
 Lys Leu Ser Tyr Arg Gly Gln Thr Lys Met Val Glu Thr Ala Leu Thr
 115 120 125
 Pro Asp Ser Cys Tyr Pro Asp
 130 135

<210> 3
 <211> 137
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 <213> Oryctolagus cuniculus

<400> 3
 Asp Asp Glu Ala Thr Ile Leu Ala Asp Asn Lys Cys Met Cys Thr Arg
 1 5 10 15
 Val Thr Ser Arg Ile Ile Pro Ser Thr Glu Asp Pro Asn Glu Asp Ile
 20 25 30
 Val Glu Arg Asn Ile Arg Ile Val Val Pro Leu Asn Asn Arg Glu Asn
 35 40 45
 Ile Ser Asp Pro Thr Ser Pro Leu Arg Arg Asn Pro Val Tyr His Leu
 50 55 60
 Ser Asp Val Cys Lys Lys Cys Asp Pro Val Glu Val Glu Leu Glu Asp
 65 70 75 80
 Gln Val Val Thr Ala Thr Gln Ser Asn Ile Cys Asn Glu Asp Asp Gly
 85 90 95

Val Pro Glu Thr Cys Tyr Met Tyr Asp Arg Asn Lys Cys Tyr Thr Thr
 100 105 110

Met Val Pro Leu Arg Tyr His Gly Glu Thr Lys Met Val Gln Ala Ala
 115 120 125

Leu Thr Pro Asp Ser Cys Tyr Pro Asp
 130 135

<210> 4
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 <213> Bos sp.

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 Ile Thr Ser Arg Ile Ile Arg Asp Pro Asp Asn Pro Ser Glu Asp Ile
 20 25 30
 Val Glu Arg Asn Ile Arg Ile Ile Val Pro Leu Asn Thr Arg Glu Asn
 35 40 45
 Ile Ser Asp Pro Thr Ser Pro Leu Arg Thr Glu Pro Lys Tyr Asn Leu
 50 55 60
 Ala Asn Leu Cys Lys Lys Cys Asp Pro Thr Glu Ile Glu Leu Asp Asn
 65 70 75 80
 Gln Val Phe Thr Ala Ser Gln Ser Asn Ile Cys Pro Asp Asp Asp Tyr
 85 90 95
 Ser Glu Thr Cys Tyr Thr Tyr Asp Arg Asn Lys Cys Tyr Thr Thr Leu
 100 105 110
 Val Pro Ile Thr His Arg Gly Val Thr Arg Met Val Lys Ala Thr Leu
 115 120 125
 Thr Pro Asp Ser Cys Tyr Pro Asp
 130 135

<210> 5
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 <222> (47)
 <223> Variable amino acid

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 <222> (88)..(89)
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<222> (91)

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Ser Ser Arg Phe Val Pro Ser Thr Glu Arg Pro Gly Glu Glu Ile Leu
 20 25 30

Glu Arg Asn Ile Gln Ile Thr Ile Pro Thr Ser Ser Arg Met Xaa Ile
 35 40 45

Ser Asp Pro Tyr Ser Pro Leu Arg Thr Gln Pro Val Tyr Asn Leu Trp
 50 55 60

Asp Ile Cys Gln Lys Cys Asp Pro Val Gln Leu Glu Ile Gly Gly Ile
 65 70 75 80

Pro Val Leu Ala Ser Gln Pro Xaa Xaa Ser Xaa Pro Asp Asp Glu Cys
 85 90 95

Tyr Thr Thr Glu Val Asn Phe Lys Lys Lys Val Pro Leu Thr Pro Asp
 100 105 110

Ser Cys Tyr Glu Tyr Ser Glu
 115

<210> 6

<211> 128

<212> PRT

<213> Lumbricus sp.

<400> 6

Asn Lys Cys Met Cys Thr Arg Val Thr Ala Arg Ile Arg Gly Thr Arg
 1 5 10 15

Glu Asp Pro Asn Glu Asp Ile Val Glu Arg Tyr Ile Arg Ile Asn Val
 20 25 30

Pro Leu Lys Asn Arg Gly Asn Ile Ser Asp Pro Thr Ser Pro Leu Arg
 35 40 45

Asn Gln Pro Val Tyr His Leu Ser Pro Ser Cys Lys Lys Cys Asp Pro
 50 55 60

Tyr Glu Asp Gly Val Val Thr Ala Thr Glu Thr Asn Ile Cys Tyr Pro
 65 70 75 80

Asp Gln Gly Val Pro Gln Ser Cys Arg Asp Tyr Cys Pro Glu Leu Asp
 85 90 95

Arg Asn Lys Cys Tyr Thr Val Leu Val Pro Pro Gly Tyr Thr Gly Glu
 100 105 110

Thr Lys Met Val Gln Asn Ala Leu Thr Pro Asp Ala Cys Tyr Pro Asp
 115 120 125

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 <211> 421
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<220>
 <221> mat_peptide
 <222> (7)..(414)

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 Asp Gln Glu Asp Glu Arg Ile Val Leu Val Asp Asn Lys Cys Lys Cys
 -1 1 5 10
 gct cgt att act tct aga atc atc cgt agc tca gag gac cca aat gaa 96
 Ala Arg Ile Thr Ser Arg Ile Ile Arg Ser Ser Glu Asp Pro Asn Glu
 15 20 25 30
 gat ata gtc gaa cgt aac atc cgt atc atc gtc cca ctg aat aac cgg 144
 Asp Ile Val Glu Arg Asn Ile Arg Ile Ile Val Pro Leu Asn Asn Arg
 35 40 45
 gag aat atc tca gat cct aca agt ccg ttg cgc aca cgc ttc gta tac 192
 Glu Asn Ile Ser Asp Pro Thr Ser Pro Leu Arg Thr Arg Phe Val Tyr
 50 55 60
 cac ctg tca gat ctg tgt aag aag tgt gat cca aca gag gta gag ctg 240
 His Leu Ser Asp Leu Cys Lys Lys Cys Asp Pro Thr Glu Val Glu Leu
 65 70 75
 gac aat cag ata gtc act gcg act caa agc aac att tgc gat gag gac 288
 Asp Asn Gln Ile Val Thr Ala Thr Gln Ser Asn Ile Cys Asp Glu Asp
 80 85 90
 agc gct aca gaa acc tgc agc acc tac gat agg aac aaa tgc tac acg 336
 Ser Ala Thr Glu Thr Cys Ser Thr Tyr Asp Arg Asn Lys Cys Tyr Thr
 95 100 105 110
 gcc gtg gtt ccg ctc gtg tat ggt gga gag aca aaa atg gtg gaa act 384
 Ala Val Val Pro Leu Val Tyr Gly Gly Glu Thr Lys Met Val Glu Thr
 115 120 125
 gcc ctt acg ccc gat gca tgc tat ccg gac tgaattc 421
 Ala Leu Thr Pro Asp Ala Cys Tyr Pro Asp
 130 135

<210> 8
 <211> 215
 <212> DNA
 <213> Homo sapiens

<220>
 <221> CDS
 <222> (1)..(213)

<400> 8
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 Asp Gln Lys Cys Lys Cys Ala Arg Ile Thr Ser Arg Ile Ile Arg Ser
 1 5 10 15
 tca gag gac cca aat gaa gat ata gtc gaa cgt aac atc cgt atc atc 96
 Ser Glu Asp Pro Asn Glu Asp Ile Val Glu Arg Asn Ile Arg Ile Ile
 20 25 30
 gtc cca ctg aat aac cgg gag aat atc tca gat cct aca agt ccg ttg 144
 Val Pro Leu Asn Asn Arg Glu Asn Ile Ser Asp Pro Thr Ser Pro Leu
 35 40 45
 cgc aca cgc ttc gta tac cac ctg tca gat ctg tgt aag aag gat gag 192
 Arg Thr Arg Phe Val Tyr His Leu Ser Asp Leu Cys Lys Lys Asp Glu
 50 55 60
 gac agc gct aca gaa acc tgc tg 215
 Asp Ser Ala Thr Glu Thr Cys
 65 70

<210> 9
 <211> 140
 <212> DNA
 <213> Homo sapiens

<400> 9
 ctagaatcat ccgtagctca gaggacccaa atgaagatat agtcgaacgt aacatccgta 60
 tcatcgcccc actgaataac cgggagaata tctcagatcc tacaagtcg ttgcgcacac 120
 gcttcgtata ccacctgtca 140

<210> 10
 <211> 31
 <212> DNA
 <213> Homo sapiens

<400> 10
 gatcagaagt gcaagtgtgc tcgtattact t 31

<210> 11
 <211> 44

<212> DNA
 <213> Homo sapiens

<220>
 <221> CDS
 <222> (1)..(42)

<400> 11
 gat ctg tgt aag aag gat gaa gat tcc gct aca gaa acc tgc tg 44
 Asp Leu Cys Lys Lys Asp Glu Asp Ser Ala Thr Glu Thr Cys
 1 5 10

<210> 12
 <211> 109
 <212> DNA
 <213> Homo sapiens

<400> 12
 gcacctacga taggaacaaa tgctacacgg ccgtgggttcc gctcgtgtat ggtggagaga 60
 caaaaatggt ggaaactgcc cttacgcccg atgcatgcta ccctgactg 109

<210> 13
 <211> 286
 <212> DNA
 <213> Homo sapiens

<220>
 <221> CDS
 <222> (1)..(279)

<400> 13
 gat cag aag tgc aag tgt gct cgt att act tct aga atc atc cgt agc 48
 Asp Gln Lys Cys Lys Cys Ala Arg Ile Thr Ser Arg Ile Ile Arg Ser
 1 5 10 15

tca gag gac cca aat gaa gat ata gtc gaa cgt aac atc cgt atc atc 96
 Ser Glu Asp Pro Asn Glu Asp Ile Val Glu Arg Asn Ile Arg Ile Ile
 20 25 30

gtc cca ctg aat aac cgg gag aat atc tca gat cct aca agt ccg ttg 144
 Val Pro Leu Asn Asn Arg Glu Asn Ile Ser Asp Pro Thr Ser Pro Leu
 35 40 45

cgc aca cgc ttc gta tac cac ctg tca gat ctg tgt aag aag tgt gat 192
 Arg Thr Arg Phe Val Tyr His Leu Ser Asp Leu Cys Lys Lys Cys Asp
 50 55 60

cca aca gag gta gag ctg gac aat cag ata gtc act gcg act caa agc 240
 Pro Thr Glu Val Glu Leu Asp Asn Gln Ile Val Thr Ala Thr Gln Ser
 65 70 75 80

aac att tgc gat gag gac agc gct aca gaa acc tgc tac tgaattc 286
 Asn Ile Cys Asp Glu Asp Ser Ala Thr Glu Thr Cys Tyr
 85 90

<210> 14
 <211> 105
 <212> DNA
 <213> Homo sapiens

<220>
 <221> CDS
 <222> (1)..(105)

<400> 14
 gat ctg tgt aag aag tgt gat cca aca gag gta gag ctg gac aat cag 48
 Asp Leu Cys Lys Lys Cys Asp Pro Thr Glu Val Glu Leu Asp Asn Gln
 1 5 10 15
 ata gtc act gcg act caa agc aac att tgc gat gag gac agc gct aca 96
 Ile Val Thr Ala Thr Gln Ser Asn Ile Cys Asp Glu Asp Ser Ala Thr
 20 25 30
 gaa acc tgc 105
 Glu Thr Cys
 35

<210> 15
 <211> 61
 <212> DNA
 <213> Homo sapiens

<400> 15
 gatcaggaag atgaacgtat tgttctggtt gacaacaagt gcaagtgtgc tcgtattact 60
 t 61

<210> 16
 <211> 198
 <212> DNA
 <213> Homo sapiens

<400> 16
 gcgatgacga cgataaggcc caaacggaga cctgtactgt tgcgcctcgt gaacggcaaa 60
 actgcggatt cccgggagta acaccctctc agtgcgctaa taaaggctgc tgttttgatg 120
 acacggtagc gggcggtccg tgggtgcttct accccaatac aattgacgtt ccgcctgaag 180
 aagagtgcga gttttaag 198

<210> 17
 <211> 138
 <212> PRT
 <213> Homo sapiens

<400> 17
 Asp Gln Glu Asp Glu Arg Ile Val Leu Val Asp Asn Lys Cys Lys Cys
 -1 1 5 10
 Ala Arg Ile Thr Ser Arg Ile Ile Arg Ser Ser Glu Asp Pro Asn Glu
 15 20 25 30


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<210> 18
<211> 71
<212> PRT
<213> Homo sapiens
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<400> 18
Asp Gln Lys Cys Lys Cys Ala Arg Ile Thr Ser Arg Ile Ile Arg Ser
  1             5             10             15
Ser Glu Asp Pro Asn Glu Asp Ile Val Glu Arg Asn Ile Arg Ile Ile
          20             25             30
Val Pro Leu Asn Asn Arg Glu Asn Ile Ser Asp Pro Thr Ser Pro Leu
          35             40             45
Arg Thr Arg Phe Val Tyr His Leu Ser Asp Leu Cys Lys Lys Asp Glu
  50             55             60
Asp Ser Ala Thr Glu Thr Cys
  65             70

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<210> 19
<211> 49
<212> PRT
<213> Homo sapiens
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<400> 19
Ser Arg Ile Ile Arg Ser Ser Glu Asp Pro Asn Glu Asp Ile Val Glu
  1                      5                      10                   15
Arg Asn Ile Arg Ile Ile Val Pro Leu Asn Asn Arg Glu Asn Ile Ser
          20                      25                      30

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Asp Pro Thr Ser Pro Leu Arg Thr Arg Phe Val Tyr His Leu Ser Asp
35 40 45

Leu

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<210> 20
<211> 12
<212> PRT
<213> Homo sapiens
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<400> 20
Asp Gln Lys Cys Lys Cys Ala Arg Ile Thr Ser Arg
1 5 10

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<210> 21
<211> 14
<212> PRT
<213> Homo sapiens
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<400> 21
Asp Leu Cys Lys Lys Asp Glu Asp Ser Ala Thr Glu Thr Cys
1 5 10

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<210> 22
<211> 36
<212> PRT
<213> Homo sapiens
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<400> 22  
Ser Thr Tyr Asp Arg Asn Lys Cys Tyr Thr Ala Val Val Pro Leu Val  
   1                   5               10                 15
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Tyr Gly Gly Glu Thr Lys Met Val Glu Thr Ala Leu Thr Pro Asp Ala
20 25 30

Cys Tyr Pro Asp
35

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<210> 23
<211> 93
<212> PRT
<213> Homo sapiens
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<400> 23
Asp Gln Lys Cys Lys Cys Ala Arg Ile Thr Ser Arg Ile Ile Arg Ser
  1             5             10             15
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Ser Glu Asp Pro Asn Glu Asp Ile Val Glu Arg Asn Ile Arg Ile Ile
20 25 30

Val Pro Leu Asn Asn Arg Glu Asn Ile Ser Asp Pro Thr Ser Pro Leu
35 40 45

Arg Thr Arg Phe Val Tyr His Leu Ser Asp Leu Cys Lys Lys Cys Asp
 50 55 60

Pro Thr Glu Val Glu Leu Asp Asn Gln Ile Val Thr Ala Thr Gln Ser
 65 70 75 80

Asn Ile Cys Asp Glu Asp Ser Ala Thr Glu Thr Cys Tyr
 85 90

<210> 24

<211> 35

<212> PRT

<213> Homo sapiens

<400> 24

Asp Leu Cys Lys Lys Cys Asp Pro Thr Glu Val Glu Leu Asp Asn Gln
 1 5 10 15

Ile Val Thr Ala Thr Gln Ser Asn Ile Cys Asp Glu Asp Ser Ala Thr
 20 25 30

Glu Thr Cys
 35

<210> 25

<211> 22

<212> PRT

<213> Homo sapiens

<400> 25

Asp Gln Glu Asp Glu Arg Ile Val Leu Val Asp Asn Lys Cys Lys Cys
 1 5 10 15

Ala Arg Ile Thr Ser Arg
 20

<210> 26

<211> 66

<212> PRT

<213> Homo sapiens

<400> 26

Cys Ser Asp Asp Asp Lys Ala Gln Thr Glu Thr Cys Thr Val Ala
 1 5 10 15

Pro Arg Glu Arg Gln Asn Cys Gly Phe Pro Gly Val Thr Pro Ser Gln
 20 25 30

Cys Ala Asn Lys Gly Cys Cys Phe Asp Asp Thr Val Arg Gly Val Pro
 35 40 45

Trp Cys Phe Tyr Pro Asn Thr Ile Asp Val Pro Pro Glu Glu Glu Cys
 50 55 60

Glu Phe
65

<210> 27
<211> 421
<212> DNA
<213> Homo sapiens

<400> 27
gaattcagtc cggatagcat gcatcgggcg taagggcagt ttccaccatt tttgtctctc 60
caccatacac gagcggaacc acggccgtgt agcatttggt cctatcgtag gtgctgcagg 120
tttctgtagc gctgtcctca tcgcaaagtgt tgctttgagt cgcagtgact atctgattgt 180
ccagctctac ctctgttgga tcacacttct tacacagatc tgacaggtgg tatacgaagc 240
gtgtgcgcaa cggacttgta ggatctgaga tattctcccg gttattcagt gggacgatga 300
tacggatggt acgttcgact atatcttcat ttgggtcctc tgagctacgg atgattctag 360
aagtaatacg agcacacttg cacttgttgt caaccagaac aatacgttca tcttcctgat 420
c 421

<210> 28
<211> 219
<212> DNA
<213> Homo sapiens

<400> 28
aattcagcag gtttctgtag cgctgtcctc atcctttctta cacagatctg acaggtggta 60
tacgaagcgt gtgcgcaacg gacttgtagg atctgagata ttctcccggg tattcagtggt 120
gacgatgata cggatgttac gttcgactat atcttcattt gggtcctctg agctacggat 180
gattctagaa gtaatacgag cacacttgca cttctgata 219

<210> 29
<211> 140
<212> DNA
<213> Homo sapiens

<400> 29
gatctgacag gtggtatacg aagcgtgtgc gcaacggact tgtaggatct gagatattct 60
cccggttatt cagtgggacg atgatacgga tgttacgttc gactatatct tcatttgggt 120
cctctgagct acggatgatt 140

<210> 30
<211> 31
<212> DNA
<213> Homo sapiens

<400> 30
ctagaagtaa tacgagcaca cttgcacttc t 31

<210> 31
<211> 44
<212> DNA
<213> Homo sapiens

<400> 31
 aattcagcag gtttctgtag cggactcttc atccttctta caca 44

<210> 32
 <211> 117
 <212> DNA
 <213> Homo sapiens

<400> 32
 aattcagtcagg gggtagcatg catcgggcgt aagggcagtt tccaccattt ttgtctctcc 60
 accatacacg agcgggaacca cggccgtgta gcatttggtc ctatcgtagg tgctgca 117

<210> 33
 <211> 282
 <212> DNA
 <213> Homo sapiens

<400> 33
 tcagtagcag gtttctgtag cgctgtcctc atcgcaaag ttgctttgag tcgcagtgac 60
 tatctgattg tccagctcta cctctgttgg atcacacttc ttacacagat ctgacagggtg 120
 gtatacgaag cgtgtgcgca acggacttgt aggatctgag atattctccc gggtattcag 180
 tgggacgatg atacggatgt tacgttcgac tatactctca tttgggtcct ctgagctacg 240
 gatgattcta gaagtaatac gagcacactt gcacttctga tc 282

<210> 34
 <211> 105
 <212> DNA
 <213> Homo sapiens

<400> 34
 gcagggtttct gtagcgctgt cctcatcgca aatgttgctt tgagtcgcag tgactatctg 60
 attgtccagc tctacctctg ttggatcaca cttcttacac agatc 105

<210> 35
 <211> 61
 <212> DNA
 <213> Homo sapiens

<400> 35
 ctagaagtaa tacgagcaca cttgcacttg ttgtcaacca gaacaatacg ttcattcttc 60
 t 61

<210> 36
 <211> 205
 <212> DNA
 <213> Homo sapiens

<400> 36
 aattcttaaa actcgactc ttcttcaggc ggaacgtcaa ttgtattggg gtagaagcac 60
 cacggaagcc ccgtaccgtg tcatcaaaac agcagccttt attagcgcac tgagagggtg 120
 ttactccccg gaatccgcag ttttgccgtt cacgaggcgc aacagtacag gtctccgttt 180
 gggccttata gtcgtcatcg ctgca 205

<210> 37
 <211> 13
 <212> PRT
 <213> Homo sapiens

<400> 37
 Asp Gln Glu Asp Glu Arg Ile Val Leu Val Asp Asn Lys
 1 5 10

<210> 38
 <211> 7
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Illustrative
 peptide

<400> 38
 Glu Asn Leu Tyr Phe Gln Ser
 1 5

<210> 39
 <211> 11
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Linker peptide

<400> 39
 Lys Ala His Lys Val Asp Met Val Gln Tyr Thr
 1 5 10

<210> 40
 <211> 4
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Linker peptide

<400> 40
 Val Gln Tyr Thr
 1

<210> 41
 <211> 6
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Linker peptide

<400> 41
 Glu Lys Ala Val Ala Asp
 1 5

<210> 42
 <211> 131
 <212> DNA
 <213> Homo sapiens

<220>
 <221> CDS
 <222> (1)..(78)

<400> 42
 atg aaa ttc tta gtc aac gtt gcc ctt ttt atg gtc gta tac att tct 48
 Met Lys Phe Leu Val Asn Val Ala Leu Phe Met Val Val Tyr Ile Ser
 1 5 10 15

 tac atc tat gcg gat ccg agc tcg agt gct ctagatctgc agctgggtacc 98
 Tyr Ile Tyr Ala Asp Pro Ser Ser Ser Ala
 20 25

 atggaattcg aagcttggag tcgactctgc tga 131

<210> 43
 <211> 26
 <212> PRT
 <213> Homo sapiens

<400> 43
 Met Lys Phe Leu Val Asn Val Ala Leu Phe Met Val Val Tyr Ile Ser
 1 5 10 15

 Tyr Ile Tyr Ala Asp Pro Ser Ser Ser Ala
 20 25

<210> 44
 <211> 4
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Intracellular
 targeting signal

<400> 44
 Lys Asp Glu Leu
 1

<210> 45
 <211> 16
 <212> PRT
 <213> Homo sapiens

<400> 45

Ala Ile Gln Asp Pro Arg Leu Phe Ala Glu Glu Lys Ala Val Ala Asp
 1 5 10 15

<210> 46

<211> 61

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 46

gacaggaag atgaacgtat tgttctggtt gacaacaagt gcaagtgtgc tcgtattact 60
 t 61

<210> 47

<211> 61

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 47

ctagaagtaa tacgagcaca cttgcacttg ttgtcaacca gaacaatacg ttcattcttc 60
 t 61

<210> 48

<211> 31

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 48

gacagaagt gcaagtgtgc tcgtattact t 31

<210> 49

<211> 31

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 49

ctagaagtaa tacgagcaca cttgcacttc t 31

<210> 50
<211> 61
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 50
gatcaggaag atgaacgtat tgttctgggt gacaacaagt gcaagtcgc tcgtattact 60
t 61

<210> 51
<211> 61
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 51
ctagaagtaa tacgagcgga cttgcacttg ttgtcaacca gaacaatag ttcattctcc 60
t 61

<210> 52
<211> 61
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 52
gatcaggaag atgaacgtat tgttctgggt gacaacaagt gcaagggtgc tcgtattact 60
t 61

<210> 53
<211> 61
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 53
ctagaagtaa tacgagcaac cttgcacttg ttgtcaacca gaacaatag ttcattctcc 60
t 61

<210> 54
 <211> 47
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 54

ctagaatcat ccgtagctca gaggacccaa atgaagatat agtcgaa

47

<210> 55
 <211> 58
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 55

gatacggatg ttacgttcga ctatatcttc atttgggtcc tctgagctac ggatgatt

58

<210> 56
 <211> 49
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 56

cgtaacatcc gtatcatcgt ccactgaat aaccgggaga atatctcag

49

<210> 57
 <211> 49
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 57

cgtaacatcc gtatcatcgt ccactgaat aaccgggagc acatctcag

49

<210> 58
 <211> 49
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 58

acggacttgt aggatctgag atattctccc ggttattcag tgggacgat

49

<210> 59

<211> 49

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 59

acggacttgt aggatctgag atgtgctccc ggttattcag tgggacgat

49

<210> 60

<211> 44

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 60

atcctacaag tccgttgccg acacgcttcg tataccacct gtca

44

<210> 61

<211> 33

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 61

gatctgacag gtggtatacg aagcgtgtgc gca

33

<210> 62

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 62

gatctgtgta agaagtgtga tccaacagag gtagagctgg acaatcagat agtcactgca 60

<210> 63
 <211> 44
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 63
 gatctgtgta agaaggatga ggacagcgct acagaaacct gctg 44

<210> 64
 <211> 44
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 64
 aattcagcag gtttctgtag cgctgtcctc atccttctta caca 44

<210> 65
 <211> 62
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 65
 gatctgtgta agaaggatga ggacagcgct acagaaacct gctacgagaa ggatgagctg 60
 tg 62

<210> 66
 <211> 62
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 66
 aattcacagc tcatccttcg cgtcgcaggt ttctgtagcg ctgtcctcat ccttcttaca 60
 ca 62

<210> 67
 <211> 59

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 67

gatctgtgta agaagtctga tatcgatgaa gattccgcta cagaaacctg cagcacatg 59

<210> 68

<211> 59

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 68

aattcatgtg ctgcagggtt ctgtagcgga atcttcatcg atatcagact tcttacaca 59

<210> 69

<211> 64

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 69

gatctgtcta agaagtctga tatcgatgaa gattacagat tcttcagact atagctactt 60
ctaa 64

<210> 70

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 70

aatcttcatc gatatcagac ttcttagaca 30

<210> 71

<211> 64

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic

oligonucleotide

<400> 71

gatctgggta agaagtctga tatcgatgaa gattaccaat tcttcagact atagctactt 60
ctaa 64

<210> 72

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 72

aatcttcacg gatatcagac ttcttaacca 30

<210> 73

<211> 41

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 73

attgtccagc tctacctctg ttggatcaca cttcttacac a 41

<210> 74

<211> 46

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 74

actcaaagca acatttgcca tgaggacagc gctacagaaa cctgca 46

<210> 75

<211> 57

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 75

ggtttctgta gcgctctgct catcgcaaat gttgctttga gtcgcagtga ctatctg 57

<210> 76
 <211> 59
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 76
 gcacctacga taggaacaaa tgctacacgg ccgtgggtcc gctcgtgtat ggtggagag 59

<210> 77
 <211> 48
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 77
 gagcggaacc acggccgtgt agcatttggt cctatcgtag gtgctgca 48

<210> 78
 <211> 50
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 78
 acaaaaatgg tggaaactgc ccttacgcc gatgcatgct atccggactg 50

<210> 79
 <211> 69
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 79
 aattcagtcc ggatagcatg catcgggcgt aagggcagtt tccaccattt ttgtctctcc 60
 accatacac 69

<210> 80
 <211> 62
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 80

acaaaaatgg tggaaactgc ccttacgccc gatgcatgct atccggacaa ggatgaattg 60
tg 62

<210> 81

<211> 81

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 81

aattcacaat tcctccttgt ccggatagca tgcctcgggc gtaagggcag tttccaccat 60
ttttgtctct ccaccataca c 81

<210> 82

<211> 88

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 82

gatcagggtcg ctgccatcca agaccgagg ctgttcgccg aagagaaggc cgtcgctgac 60
tccaagtgc agtgtgctcg tattactt 88

<210> 83

<211> 88

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 83

ctagaagtaa tacgagcaca cttgcacttg gagtcagcga cggccttctc ttcggcgaac 60
agcctcgggt cttggatggc agcgacct 88

<210> 84

<211> 34

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 84

tggtacgaat tccaggttsma rctgcagsag tcrg

34

<210> 85

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 85

acagatatcg ggatttctcg cagactc

27

<210> 86

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 86

acagaatatc gtcaacacct tcccaccc

28

<210> 87

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 87

acaaagcttt tatttaccg acagacggtc

30

<210> 88

<211> 35

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 88

gtccccctc gagcgayaty swgmtsaccc artct

35

<210> 89

<211> 28

<212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Primer

<400> 89
 acactgcagc agttggtgca gcatcagc

28

<210> 90
 <211> 53
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Primer

<400> 90
 ctgcaggaag cggaagcgga ggaagcgga gggaggaag cggaagcgaa ttc

53

<210> 91
 <211> 47
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Linker
 complement

<400> 91
 ccttcgcctt cgctctcttc gccttcgcct ccttcgcctt cgcttaa

47

<210> 92
 <211> 76
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Signal peptide

<400> 92
 acaggatcca tggaaacccc agcgcagctt ctcttcctcc tgctactctg gctcccaaga 60
 taccaccgga cccggg 76

<210> 93
 <211> 33
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Primer

<400> 93
 tggtagat ctaggtsmar ctgcagsagt crg

33

<210> 94
 <211> 28
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Primer

<400> 94
 acaggaattc aattttcttg tccacctt 28

<210> 95
 <211> 29
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Primer

<400> 95
 gttctagaga yatyswgmts acccartct 29

<210> 96
 <211> 28
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Primer

<400> 96
 acaccgcggc agttggtgca gcatcagc 28

<210> 97
 <211> 75
 <212> DNA
 <213> Homo sapiens

<400> 97
 acaggatcca tggaaacccc agcgcagctt ctcttctctc tgctactctg gctcccagat 60
 accaccggaa gatct 75

<210> 98
 <211> 75
 <212> DNA
 <213> Homo sapiens

<400> 98
 acaactagta tggaaacccc agcgcagctt ctcttctctc tgctactctg gctcccagat 60
 accaccggat ctaga 75

<210> 99
 <211> 13
 <212> PRT
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Linker peptide

<400> 99

Val Ala Val Gln Ser Ala Gly Thr Pro Ala Ser Gly Ser
 1 5 10

<210> 100

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Nuclear
 targeting sequence

<400> 100

Cys Ala Ala Pro Lys Lys Lys Arg Lys Val
 1 5 10

<210> 101

<211> 22

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Nuclear
 targeting sequence

<400> 101

Cys Ala Ala Lys Arg Pro Pro Ala Ala Ile Lys Lys Ala Ala Ala Gly
 1 5 10 15

Gln Ala Lys Lys Lys Lys
 20

<210> 102

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Intracellular
 targeting signal

<400> 102

His Asp Glu Leu
 1

<210> 103
 <211> 77
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 103

gcgatgacga cgataaggcc caaacggaga cctgtactgt tgcgcctcgt gaacggcaaa 60
 actgcggatt cccggga 77

<210> 104
 <211> 66
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 104

gttttgccgt tcacgaggcg caacagtaca ggtctccgtt tgggccttat cgtcgtcatc 60
 gctgca 66

<210> 105
 <211> 72
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 105

gtaacaccct ctacgtgcgc taataaaggc tgctgttttg atgacacggt acggggcggtt 60
 ccgtggtgct tc 72

<210> 106
 <211> 72
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 106

gccccgtacc gtgtcatcaa aacagcagcc ttattagcg cactgagagg gtgttactcc 60
 cggaatccg ca 72

<210> 107
 <211> 49

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 107

tacccaata caattgacgt tccgcctgaa gaagagtgcg agttttaag

49

<210> 108

<211> 68

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 108

aattcttaaa actcgactc ttcttcaggc ggcaagtcaa ttgtattggg gtagaagcac 60
cacggaac 68

<210> 109

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Linker peptide

<400> 109

Pro Leu Gly Ile Ile Gly Gly
1 5

<210> 110

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Linker peptide

<400> 110

Ile Ile Gly Gly
1

<210> 111

<211> 30

<212> PRT

<213> Homo sapiens

<400> 111

Val Arg Asp Gln Ala Gln Glu Asn Arg Ala Ser Gly Asp Ala Gly Ser
 1 5 10 15

Ala Asp Gly Gln Ser Arg Ser Ser Ser Ser Lys Val Leu Phe
 20 25 30

<210> 112

<211> 25

<212> PRT

<213> Homo sapiens

<400> 112

Val Pro Ser Thr Pro Pro Thr Pro Ser Pro Ser Thr Pro Pro Thr Pro
 1 5 10 15

Ser Pro Ser Cys Cys His Pro Arg Leu
 20 25

<210> 113

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Illustrative peptide

<400> 113

Glu Gln Lys Leu Ile Ser Glu Asp Leu
 1 5